

I have very little doubt but that many more species of ants will be discovered even in the southern portion of the Peninsula, and I hope myself to add others to the present list, and more especially to gain additional information on their habits.

### XI.—Note on the Greenland and Iceland Falcons.

By JOHN HANCOCK, Esq.

SINCE the publication of my paper in 1838 on the Greenland and Iceland Falcons, I have had the opportunity of examining a great number of specimens of both species, and have found much to corroborate the opinion I then expressed of the distinctness of the two kinds. I must now have seen upwards of 150 specimens, and have had in my possession at one time no less than seventy individuals. This extended experience enables me to correct an error in the description of *Falco Grœnlandicus*. I find that I have confounded the young with the adult of this species, and am wrong regarding the immature.

When I drew up my paper I considered all the white birds from Greenland to be mature, describing the nest plumage from a dark specimen, which having a white quill-feather coming, seemed to prove that it was the young of this species. There is now no doubt that this is wrong, and that this individual is really an immature Iceland falcon,—the white quill-feather being abnormal.

The Greenland falcon is never dark like the young of the other species; in fact, the nest plumage of the former is always whiter than the mature plumage of the latter, and is not unfrequently as white as that of the mature of its own species.

The mature Greenland falcon is distinguished from the young, not so much by its greater whiteness as by the character of the markings, which on the back and scapulars are always cordate inclining to sagittiform; the head, under parts and tail are frequently unspotted, but not by any means constantly so. The young is characterized by having the upper parts marked with large oblong spots, and the head and under parts with long narrow dashes. In both old and young the markings are of a dark warm gray, almost black in the former, which is also distinguished by the cere, beak, feet and toes being of a pale yellow or straw colour; while in the young, these parts, with the exception of the beak, are of a light livid blue. Some of the young are very white, so that they can be distinguished only by the form of the spots and colour of the naked parts. In such the spots or dashes on the head and under parts are reduced to mere lines, scarcely wider than the shafts of the feathers, and

the tail is not uncommonly devoid of all markings. Other nest birds are comparatively dark, with the spots large and crowded. The former, on maturity, are very little spotted, and have all the under parts, head and tail not unfrequently pure white; the latter never attain the same degree of whiteness, but change into the dark and richly marked varieties of the adult.

There is no doubt with regard to the mature and immature state of this species. I possess several specimens with the large oblong markings of the nest plumage, which are moulting, and in every case the new feathers have the cordate spots of maturity; and to show that no change takes place afterwards, it is only necessary to refer to the beautiful specimen which was kept alive in the Zoological Gardens, Regent's Park. This individual was a male; it had the plumage very light; and when I first saw it in 1849 it exhibited both mature and immature feathers; the old and faded ones, on the upper parts, having the oblong spots of the first plumage, the new feathers of the back and scapulars being all marked with cordate spots. I took a drawing of the bird in this state. On completing its moult it was one of the whitest specimens I have ever seen. It lived until May 1852, and must consequently have changed its plumage twice after having assumed its mature dress; but no further alteration took place in the form of the markings, and the bird was as white on its first moult as it was when it died. Another living specimen, which I had in my possession some years ago, moulted once. This was mature when I received it, and it was as white then as after its moult; and no change whatever took place in the character of its plumage. It may also be stated that I have several specimens in the mature plumage which have partially cast their feathers, and those coming are exactly like the old ones—neither darker nor whiter—the feathers of the upper parts bearing the same characteristic cordate spots. Thus there appears ample proof that the birds with oblong spots on the upper parts change at once into those with cordate spots, and that the latter undergo no subsequent alteration; the one is therefore evidently the young of the other, and is undoubtedly in the first or nest plumage, unless this species be an exception to the rule, that all the true falcons get the mature plumage on the first moult: the Iceland falcon, peregrine, merlin, hobby, red-legged falcon and kestrel all do.

*Falco Grœnlandicus* then differs from *F. Islandicus* in both the mature and immature states, and is characterized by its greater whiteness of plumage. The former, in fact, may be stated to have white feathers with dark markings, the latter dark feathers with white markings; besides that the mature Iceland falcon is further distinguished by conspicuous transverse bands above and

on the flanks, and by the blue colour of the beak and bright yellow of the cere and feet. It is now certain that the continuity or non-continuity of the bars of the tail is not of specific importance, as I originally thought. No further observations need be made here respecting the young and adult plumages of *F. Islandicus*, as in my former paper I described from birds shot at their breeding station, having in my possession a brood with their two parents. It therefore only remains to be shown that no change takes place in this species after it has attained its mature garb; and of this there is now sufficient evidence.

In August 1847 I received a living mature male Iceland falcon; it had not quite completed its first moult, having still a few of the nest feathers, and was a fine characteristic specimen. It died in June 1850, after having cast its feathers three times; and its last plumage was precisely similar to that of its first mature dress—being no whiter nor in the least changed in the markings. Another individual may be alluded to which was brought to England in 1846, and which I saw in November 1848, after it had completed its second moult. It was afterwards sent to the Zoological Gardens, Regent's Park, where I saw it again in the beginning of last year (1853); and though it must then have changed its plumage four times since I first examined it, there was no perceptible difference in its whiteness, or in the character of its markings. Other examples might be cited, for I have had many opportunities of seeing this species alive; but the above would seem quite sufficient to prove that the Iceland falcon undergoes no further change after having attained its mature plumage.

In conclusion it may be stated that the characters of the two forms are permanent and sharply defined, never blending into each other; and that the young as well as the mature birds can always be distinguished. But whether these two falcons are to be considered distinct species or mere races must depend upon the views entertained regarding what is to constitute specific character. For my own part I see no reason to doubt the correctness of the opinion I originally expressed.

## XII.—On the Structure of the Echinoderms.

By JOHANNES MÜLLER.

[Continued from p. 24.]

### *Ambulacræ of the Asteridæ.*

WITH the restriction of the ambulacræ to the ventral surface in the *Asteridæ*, all differences among the feet disappear. They are always locomotive and either conical, as in all *Asteridæ* without